

LOCAL AREA NETWORK CONTROL APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to a local area network control apparatus. More particularly, it relates to a local area network control apparatus for realizing high-speed data transmission and reception with a local area network among computer terminals which are installed in appropriate places within a building or a factory.

FIG. 1 is a block diagram of a data transmission and reception system which includes a prior-art local area network control apparatus of the type specified above. Referring to FIG. 1, numeral 100 designates the prior-art local area network control apparatus having a channel interface unit 101, an internal memory 102, a Media Access Control (MAC) processing unit 108, a physical signal processing unit 109 and an internal processor 110, which are all interconnected by an internal bus 111. The internal memory 102 is furnished with an Higher Layer Interface (HLIF) module 103 and a transmission/reception buffer 107. In addition, numeral 200 designates a host computer having a main storage 201, a processor 203 and an input/output channel 205, which are all interconnected by a system bus 204. The main storage 201 stores a suitable number of appropriate kinds of user programs; Program 1 (202a), Program 2 (202b) and Program 3 (202c). The input/output channel 205 is connected with the channel interface unit 101 of the local area network control apparatus 100 by an input/output channel cable 300. Symbols 500a, 500b and 500c denote interactive computer terminals which are the opposite parties of data transmission and reception, and which are respectively labeled interactive terminals #1, #2 and #3. These terminals are connected to the local area network control apparatus 100 through a transmission medium 400. In addition, FIG. 2 is a flow chart for explaining the operation of the prior-art example.

Next, the operation will be explained. It is assumed that the local area network control apparatus 100 commences operating upon the receipt of a predetermined input/output control command given thereto through the input/output channel 205 and input/output channel cable 300 from any of Program 1 (202a)-Program 3 (202c), the user programs within the main storage 201 of the host computer 200. First, the command from the corresponding user program is analyzed by the HLIF module 103 within the internal memory 102 (S700), and it is determined whether data is to be transmitted or received (S701). Subsequently, if transmission has been determined, the transmission data from the side of the host computer 200 is accepted by the transmission/reception buffer 107 within the internal memory 102, and a MAC protocol is executed (a header is generated) by the MAC processing unit 108 (S702), whereupon data is transferred from the physical signal processing unit 109 to the transmission medium 400 (S703). On the other hand, if reception has been determined, the reception of data from any of the #1-#3 interactive terminals 500a-500c is awaited (S704). When the required data has appeared on the transmission medium 400, a MAC protocol is executed (a header is removed) by the MAC processing unit 108 through the physical signal processing unit 109 (S705), and the data containing the protocol is derived.

Upon carrying out the transmittal and receipt of the data between the computer terminals in this manner, communication protocols are not always limited to one

specified type, but there can be a large number of modifications, depending upon the sort of computer terminals used and the level of standardization of the protocols. Among these, protocols of and below a data link layer, MAC protocols (for example, IEEE 8023

Carrier-Sense Multiple Access/Collision Detection CSMA/CD

and Logical Link Control (LLC) protocols (for example, IEEE 8022) by IEEE 802 Committee have been considerably standardized. In addition, as to protocols of a network layer, the connection type and the connectionless type are being established by

the International Standard Organization (ISO).

It is therefore the present situation that the protocol standardization differs with the sort of computer terminals used.

The prior-art local area network control apparatus is constructed and operated as described above, and the required protocols for the computer terminals constituting a local area network are not completely standardized. This has led to the problem that unstandardized protocols must be processed by software provided on the computer terminal side which increases overhead.

SUMMARY OF THE INVENTION

This invention has been made in order to solve the problems mentioned above, and has for its object to provide a local area network control apparatus having slight overhead and capable of flexible processing in which the function of executing protocols up to the so-called network layer is provided thereby to enhance the processing performance of the control apparatus, and in which when a protocol at a predetermined level between the control apparatus and an interactive data transmission/reception terminal differs, it is bypassed and can be processed by software corresponding thereto.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a data transmission/reception system which includes a prior-art local area network control apparatus;

FIG. 2 is a flow chart for explaining the operation of the prior-art example;

FIG. 3 is a block diagram of a data transmission/reception system which includes a local area network control apparatus embodying this invention;

FIG. 4 is a format diagram of a control table in the embodiment;

FIG. 5 is a flow chart for explaining the operation relevant to the control table;

FIG. 6 is a flow chart for explaining the processing steps of data transmission in the embodiment; and

FIG. 7 is a flow chart for explaining the processing steps of data reception in the embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 3 is a block diagram of a data transmission/reception system which includes a local area network control apparatus embodying this invention. Referring to FIG. 3, the internal memory 102A of a local area network control apparatus 100A includes an HLIF module 103A which has a bypass function based on content indicated in a protocol execution range, an L3 module 104 as a program module which implements the function of executing the protocols of a network layer,